UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,258	06/19/2003	Wolfgang Stephan	13911-080001	6725

				EXAMINER
32864	7590	12/30/2005		COLAN, GIOVANNA B

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ART UNIT	PAPER NUMBER
2162	

DATE MAILED: 12/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>19 June 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-60</u> is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-60</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>19 June 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>06/19/2003</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   This action is issued in response to applicant filed application on 06/19/03.

2.   Claims 1-60 are pending.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4.   Claim 8, 12, 31, 44, and 48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8, 31, and 44 recite the limitation " x is in the range of 256 to 512 and y is in the range of 128 to 256 " in lines 1 – 2. It is unclear what type of units is involved in such range. In addition, the lowest range value of x "256" is the same as the highest range value of y "256". It is unclear whether this is a single range which covers both values of x and y or not. This renders the claims indefinite.

Claim 12, and 48 recite the limitation "approximately 80 to 90 %" in line 1. It is unclear whether the claim refers an amount within this range or outside. This renders the claim 12 and 48 indefinite.

Appropriate action is required.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6.   Claim 1 – 7, 8 – 30, 32 – 43, and 45 – 60 are rejected under 35 U.S.C. 102(e) as

being anticipated by Broder et al. (Broder hereinafter) (US Patent Application Pub No.

2004/0243560 A1).

Regarding Claim 1 and 37, Broder discloses an article comprising a machine-

readable medium storing instructions operable to cause one or more machines to

perform operations comprising:

determining a value x such that at least a majority of the index terms occur in x

documents or fewer (Page 17 and 18, [0307] and [0317], lines 1 – 3 and 4 – 7, Broder);

determining a value y, where y is not equal to x (Page 15, [0277], lines 1 – 2, k

be the smallest index, Broder);

generating an inverted index for the collection of documents (Page 9, [0162],

lines 1 – 3, Broder), the inverted index including an inverted list for each of the index

terms (Page 14, [0244], lines 2 – 3, Broder), each inverted list including at least one

posting (Page 14, [0244], lines 2 – 5, Broder) and, if the number of postings exceeds x

(Page 14, [0245], lines 7 – 10, Broder[1]), further including a skip entry after the xth

posting (Page 14, [0245], lines 10 – 12, Broder) and one or more skip entries thereafter

at intervals of every yth posting (Page 15, [0277], lines 1 – 6, Broder[2]).

Regarding Claims 2, and 38, Broder discloses a method, wherein each posting

includes a document identifier identifying a document in the collection of documents

(Page 14, [0244], lines 1 – 6, document unique identifier DID, Broder), a position

identifier identifying a position of the index term in the document (Page 14, [0244], lines

8 – 9, offsets of occurrences, Broder), and a frequency of the index term occurring in

the document (Page 14 and 18, [0244] and [0316], lines 7 – 8 and 9 – 11, number of

occurrences of the terms/ frequency; respectively, Broder).

Regarding Claims 3, and 39, Broder discloses a method, wherein a skip entry

identifies the smallest document number of documents included in the postings

immediately following the skip entry in the inverted list (Fig. 27, item 5, Page 16 and 17,

[0301], lines 10 – 18, Broder[3]).

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[1] Broder discloses that the method next(id) (page 14, [0245], lines 8 – 10). This method states that if there is **not** such document which DID >=id (where DID = number of documents, and id = number of posting), then the term iterator returns a special posting that is larger than all the existing DIDs. This implies that, if there is DID < id (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

[2] The cursor is advanced to the position of k value. There is a skip entry at the kth value.

[3] According to Broder, the pivot DID is the smallest DID that might be a candidate (Page 17, [0301], lines 17 – 18). In addition, Broder discloses that this pivot term goes through an "if" statement which finds a

Regarding Claims 4, and 40, Broder discloses a method, wherein the skip entry

further includes information to locate the next skip entry in the inverted list (Fig. 27,

items 13 and 22, Broder[4]).

Regarding Claims 5, and 41, Broder discloses a method, wherein a skip entry

identifies the largest document number of documents included in the postings

immediately preceding the skip entry in the inverted list (Page 17, [0302], lines 22 – 26,

Broder[5]).

Regarding Claims 6, and 42, Broder discloses a method, wherein the skip entry

further includes information to locate the next skip entry in the inverted list (Fig. 27,

items 13 and 22, Broder[6]).

Regarding Claims 7, and 43, Broder discloses a method including all the

limitations of claim 1, and 37, as disclosed above, wherein y is less than x (Page 15,

[0277], lines 1 – 2, k be the smallest index, Broder).

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first pivot term with UB (upper bound) greater than the threshold (Fig. 27, item 5). This implies that the "next" method will return the smallest possible document number following the last one.

[4] Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

[5] The next() function iterates trough the list and selects from the preceding terms the term with the location greater (largest document number of documents) than the pivot location.

[6] Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

Regarding Claims 9, and 45, Broder discloses a method, wherein the collection

of one or more documents includes one or more binary files, data tables, source code

files, text documents or combinations thereof (Page 9, [0158], lines 1 – 13, Broder).

Regarding Claims 10, and 46, Broder discloses a method including all the

limitations of claim 1, and 37, as disclosed above, further comprising:

compressing the inverted index (Page 15, [0273], lines 1 – 3, zipping, Broder).

Regarding Claims 11, and 47, Broder discloses a method, wherein substantially

all of the index terms occur in x documents or fewer (Page 15, [0257], lines 14 – 16,

Broder).

Regarding Claims 12, and 48, Broder discloses a method, wherein approximately

80 to 90% of the index terms occur in x documents or fewer (Page 17, [0307], lines 1 –

3, top n results, Broder).

Regarding Claims 13, and 49, Broder discloses a method, wherein for each

inverted list, if the number of postings exceeds x, further including a skip entry before

the first posting in the inverted list (Page 15, [0257], lines 12 – 20, the result is inserted,

Broder).

Regarding Claims 14, and 50, Broder discloses a method, wherein for each

inverted list, if the number of postings exceeds x (Page 14, [0245], lines 7 – 10,

Broder[7]), further including a skip entry after the last posting in the inverted list (Page 14,

[0245], lines 10 – 12, Broder).

    Regarding Claim 15, and 51, Broder discloses an article comprising a machine-

readable medium storing instructions operable to cause one or more machines to

perform operations comprising:

    receiving a collection of documents, each document comprising one or more

index terms (Page 14, [0244], lines 3 – 5, Broder);

    determining a value x, wherein at least a majority of the index terms occur in x

documents or fewer (Page 17 and 18, [0307] and [0317], lines 1 – 3 and 4 – 7, Broder);

    determining a value y, wherein y is not equal to the value of x (Page 15, [0277],

lines 1 – 2, k be the smallest index, Broder);

    generating an inverted index for the collection of documents (Page 9, [0162],

lines 1 – 3, Broder), the inverted index including an inverted list for each of the index

terms (Page 14, [0244], lines 2 – 3, Broder), each inverted list including at least one

posting (Page 14, [0244], lines 2 – 5, Broder) and, if the number of postings exceeds x

(Page 14, [0245], lines 7 – 10, Broder[8]), further including a skip entry after the xth

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[7]Broder discloses that the method next(id) (page 14, [0245], lines 8 – 10). This method states that if there is **not** such document which DID >=id (where DID = number of documents, and id = number of posting), then the term iterator returns a special posting that is larger than all the existing DIDs. This implies that, if there is DID < id (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

[8]Broder discloses that the method next(id) (page 14, [0245], lines 8 – 10). This method states that if there is **not** such document which DID >=id (where DID = number of documents, and id = number of posting), then the term iterator returns a special posting that is larger than all the existing DIDs. This implies that, if there is DID < id (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

posting (Page 14, [0245], lines 10 – 12, Broder) and one or more skip entries thereafter

at intervals of every yth posting (Page 15, [0277], lines 1 – 6, Broder[9]).

Additional limitations of claims 15 and 51, not included above, have been

rejected under the same criteria as claims 8, 31, and 44 (See claims 8, 31, and 44 -

Claim Rejections - 35 USC § 112- listed on this office action).

Regarding Claims 16, and 52, Broder discloses a method, wherein each posting

includes a document identifier identifying a document in the collection of documents

(Page 14, [0244], lines 1 – 6, document unique identifier DID, Broder), a position

identifier identifying a position of the index term in the document (Page 14, [0244], lines

8 – 9, offsets of occurrences, Broder), and a frequency of the index term occurring in

the document (Page 14 and 18, [0244] and [0316], lines 7 – 8 and 9 – 11, number of

occurrences of the terms/ frequency; respectively, Broder).

Regarding Claims 17, and 53, Broder discloses a method, wherein a skip entry

identifies the smallest document number of documents included in the postings

immediately following the skip entry in the inverted list (Fig. 27, item 5, Page 16 and 17,

[0301], lines 10 – 18, Broder[10]).

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[9] The cursor is advanced to the position of k value. There is a skip entry at the kth value.
[10] According to Broder, the pivot DID is the smallest DID that might be a candidate (Page 17, [0301], lines
17 – 18). In addition, Broder discloses that this pivot term goes through an "if" statement which finds a
first pivot term with UB (upper bound) greater than the threshold (Fig. 27, item 5). This implies that the
"next" method will return the smallest possible document number following the last one.

Regarding Claims 18, and 54, Broder discloses a method, wherein the skip entry

further includes information to locate the next skip entry in the inverted list (Fig. 27,

items 13 and 22, Broder[11]).

Regarding Claims 19, and 55, Broder discloses a method, wherein a skip entry

identifies the largest document number of documents included in the postings

immediately preceding the skip entry in the inverted list (Page 17, [0302], lines 22 – 26,

Broder[12]).

Regarding Claims 20, and 56, Broder discloses a method, wherein the skip entry

further includes information to locate the next skip entry in the inverted list (Fig. 27,

items 13 and 22, Broder[13]).

Regarding Claims 21, and 57, Broder discloses a method, wherein substantially

all of the index terms occur in x documents or fewer (Page 15, [0257], lines 14 – 16,

Broder).

Regarding Claims 22, and 58, Broder discloses a method, wherein approximately

80 to 90% of the index terms occur in x documents or fewer (Page 17, [0307], lines 1 –

3, top n results, Broder).

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[11] Posting[aterm] (located in the function next()) represents the information to locate next skip entry.
[12] The next() function iterates trough the list and selects from the preceding terms the term with the location greater (largest document number of documents) than the pivot location.
[13] Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

Regarding Claims 23, and 59, Broder discloses a method, wherein for each

inverted list, if the number of postings exceeds x, further including a skip entry before

the first posting in the inverted list (Page 15, [0257], lines 12 – 20, the result is inserted,

Broder).

Regarding Claims 24, and 60, Broder discloses a method, wherein for each

inverted list, if the number of postings exceeds x (Page 14, [0245], lines 7 – 10,

Broder[14]), further including a skip entry after the last posting in the inverted list (Page

14, [0245], lines 10 – 12, Broder).

Regarding Claim 25, Broder discloses an inverted index for a collection of

documents (Page 9, [0162], lines 1 – 3, Broder), each document comprising one or

more index terms (Page 14, [0244], lines 3 – 5, Broder), the inverted index comprising:

an inverted list for each index term in the collection of documents (Page 14,

[0244], lines 2 – 3, Broder); and

one or more inverted lists including a quantity of postings (Page 14, [0244], lines

2 – 5, Broder) that exceeds a value x (Page 14, [0245], lines 7 – 10, Broder), a skip

entry after the xth posting (Page 14, [0245], lines 10 – 12, Broder), and one or more

additional skip entries thereafter at intervals of every yth posting (Page 15, [0277], lines

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[14]Broder discloses that the method next(id) (page 14, [0245], lines 8 – 10). This method states that if
there is **not** such document which DID >=id (where DID = number of documents, and id = number of
posting), then the term iterator returns a special posting that is larger than all the existing DIDs. This

1 – 6, Broder[15]), where the value x is such that at least a majority of the index terms

occur in x documents or fewer (Page 15, [0257], lines 15 – 16, Broder[16]), and the value

y is not equal to the value x (Page 15, [0277], lines 1 – 2, Broder[17]).

Regarding Claim 26, Broder discloses an inverted index, wherein each posting

includes a document identifier identifying a document in the collection of documents

(Page 14, [0244], lines 1 – 6, document unique identifier DID, Broder), a position

identifier identifying a position of the index term in the document (Page 14, [0244], lines

8 – 9, offsets of occurrences, Broder), and a frequency of the index term occurring in

the document (Page 14 and 18, [0244] and [0316], lines 7 – 8 and 9 – 11, number of

occurrences of the terms/ frequency; respectively, Broder).

Regarding Claim 27, Broder discloses an inverted index, wherein a skip entry

identifies the smallest document number of documents included in the postings

immediately following the skip entry in the inverted list (Fig. 27, item 5, Page 16 and 17,

[0301], lines 10 – 18, Broder[18]).

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implies that, if there is DID < id (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

[15] The cursor is advanced to the position of k value. There is a skip entry at the kth value.

[16] Since the method next(id) can iterate to a given entry in the posting list (Page 14, lines 6 – 8). This implies that the top n results could be entered in the id parameter of such method.

[17] Y would be the smallest index k. And x would be the top n documents (the size of the heap) (Page 15, [0257], lines 15 – 16).

[18] According to Broder, the pivot DID is the smallest DID that might be a candidate (Page 17, [0301], lines 17 – 18). In addition, Broder discloses that this pivot term goes through an "if" statement which finds a first pivot term with UB (upper bound) greater than the threshold (Fig. 27, item 5). This implies that the "next" method will return the smallest possible document number following the last one.

Regarding Claim 28, Broder discloses an inverted index, wherein the skip entry further includes information to locate the next skip entry in the inverted list (Fig. 27, items 13 and 22, Broder[19]).

Regarding Claim 29, Broder discloses an inverted index, wherein a skip entry identifies the largest document number of documents included in the postings immediately preceding the skip entry in the inverted list (Page 17, [0302], lines 22 – 26, Broder[20]).

Regarding Claim 30, Broder discloses an inverted index, as disclosed above, wherein the skip entry further includes information to locate the next skip entry in the inverted list (Fig. 27, items 13 and 22, Broder[21]).

Regarding Claim 32, Broder discloses an inverted index, wherein substantially all of the index terms occur in x documents or fewer (Page 15, [0257], lines 14 – 16, Broder).

Regarding Claim 33, Broder discloses an inverted index, wherein approximately 80 to 90% of the index terms occur in x documents or fewer (Page 17, [0307], lines 1 – 3, top n results, Broder).

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[19] Posting[aterm] (located in the function next()) represents the information to locate next skip entry.
[20] The next() function iterates trough the list and selects from the preceding terms the term with the location greater (largest document number of documents) than the pivot location.
[21] Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

Regarding Claim 34, Broder discloses an inverted index, wherein the collection of one or more documents includes one or more binary files, data tables, source code files, text documents or combinations thereof (Page 9, [0158], lines 1 – 13, Broder).

Regarding Claim 35, Broder discloses an inverted index, wherein the one or more inverted lists further include a skip entry before the first posting in the inverted list (Page 15, [0257], lines 12 – 20, the result is inserted, Broder).

Regarding Claim 36, Broder discloses an inverted index, wherein the one or more inverted lists further include a skip entry after the last posting in the inverted list (Page 14, [0245], lines 10 – 12, Broder).

Prior art Made of Record

1.   Broder et al. (US Patent Application Pub. No. 2004/0243560 A1) discloses a system, method and computer program product for performing unstructured information management and automatic text analysis, including an annotation inverted file system facilitating indexing and searching.

2.   Antoshenkov (US Patent No. 6,439,783 B1) discloses a range-based query optimizer.

3.   Huynh et al. (US Patent No. 5,539,899) discloses a system and method for handling a segmented program in a memory for a multitasking data processing system utilizing paged virtual storage.

Points of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Giovanna Colan whose telephone number is (571) 272-2752. The examiner can normally be reached on 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Giovanna Colan
Examiner
Art Unit 2162
December 21, 2005

HOSAIN ALAM
SUPERVISORY PATENT EXAMINER

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